

United States Department of Agriculture Natural Resources Conservation Service

Ecological Site Description

Site Type: Rangeland

Site Name: Sandy Lowland 12-17" Precipitation Zone

Site ID: R067AY152WY

Major Land Resource Area: 67 – North Central High Plains

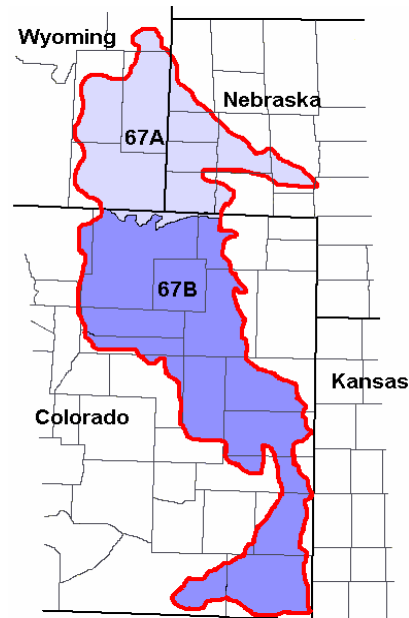
Physiographic Features

This site occurs on nearly level areas that receive additional water from overflow of intermittent streams or runoff from adjacent slopes and have a water table within reach of trees (within 20 feet).

Landform: alluvial fans, stream terraces

Aspect: N/A

	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	3800	6500
Slope (percent):	0	6
Water Table Depth (inches):	60	240
Flooding:		
Frequency:	occasional	frequent
Duration:	brief	long
Ponding:		
Depth (inches):	0	0
Frequency:	none	none
Duration:	none	none
Runoff Class:	negligible	low



Climatic Features

Annual precipitation ranges from 12-17 inches per year. Wide fluctuations may occur in yearly precipitation and result in more dry years than those with more than normal precipitation. Temperatures show a wide range between summer and winter and between daily maximums and minimums, due to the high elevation and dry air, which permits rapid incoming and outgoing radiation. Cold air outbreaks from Canada in winter move rapidly from northwest to southeast and account for extreme minimum temperatures. Chinook winds may occur in winter and bring rapid rises in temperature. Extreme storms may occur during the winter, but most severely affect ranch operations during late winter and spring.

Wind speed averages about 8 mph, ranging from 10 mph during the spring to 7 mph during late summer. Daytime winds are generally stronger than nighttime and occasional strong storms may bring brief periods of high winds with gusts to more than 75 mph.

Growth of native cool-season plants begins about April 1 and continues to about July 1. Native warm-season plants begin growth about May 15 and continue to about August 15. Green up of cool season plants may occur in September and October of most years.

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MLRA: 67 – North Central High Plains

Sandy Lowland 12-17" P.Z.
R067AY152WY

The following information is from the "Lusk 2SW" climate station.

	<u>Minimum</u>	<u>Maximum</u>
Frost-free period (days):	74	148
Freeze-free period (days):	101	181
Mean Annual Precipitation (inches):	12	17

Mean annual precipitation: 15.71 inches

Mean annual air temperature: 45.2 °F (31.0°F Avg. Min. – 59.3°F Avg. Max.)

For detailed information visit the Natural Resources Conservation Service National Water and Climate Center at <http://www.wcc.nrcs.usda.gov/> website. Other climate station(s) representative of this precipitation zone include: "Chugwater, Wheatland 4N, Cheyenne AP and Scottsbluff WSO AP".

Influencing Water Features

Wetland Description:	<u>System</u>	<u>Subsystem</u>	<u>Class</u>	<u>Sub-class</u>
None	None	None	None	None

Stream Type: C (Rosgen System)

Representative Soil Features

The soils of this site are deep to very deep, well to excessively well drained and mixed alluvium. Layers of soil most influential to the plant community vary from 3 to 6 inches thick.

Major Soil Series correlated to this site include: Glenberg, Bankard, Craft, Lemoyne

Other Soil Series correlated to this site include: Coaliam, Haverdad, Haverson

Parent Material Kind: alluvium

Parent Material Origin: sandstone, shale

Surface Texture: fine sandy loam, sandy loam, very fine sandy loam

Surface Texture Modifier: none

Subsurface Texture Group: sandy

Surface Fragments ≤ 3" (% Cover): 0

Surface Fragments > 3" (%Cover): 0

Subsurface Fragments ≤ 3" (% Volume): 0

Subsurface Fragments > 3" (% Volume): 0

	<u>Minimum</u>	<u>Maximum</u>
Drainage Class:	well	excessively
Permeability Class:	moderate	moderately rapid
Depth (inches):	20	>60
Electrical Conductivity (mmhos/cm) ≤20":	0	8
Sodium Absorption Ratio ≤20":	0	10
Soil Reaction (1:1 Water) ≤20":	6.6	8.4
Available Water Capacity (inches) ≤30":	1.0	6.2
Calcium Carbonate Equivalent (percent) ≤20":	0	5

Plant Communities

Ecological Dynamics of the Site

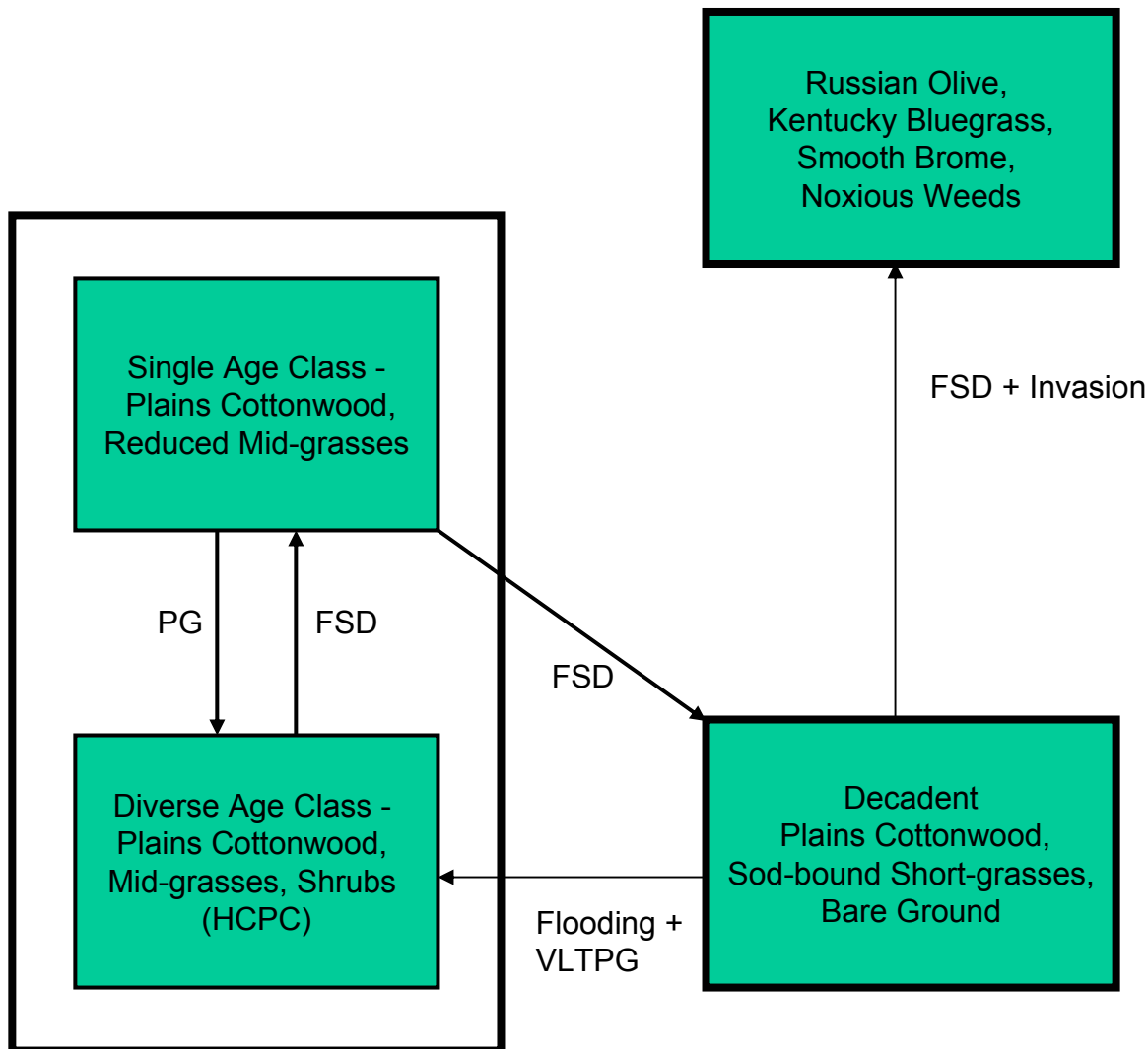
As this site deteriorates from frequent and severe grazing, mid to tall grasses such as needleandthread, little bluestem, and sand bluestem decrease. Eventually, western wheatgrass will decrease in frequency and production. New seedlings of plains cottonwood will be eliminated before they can become established. Short, sod-forming grasses such as blue grama and threadleaf sedge will increase. Eventually, only a single age-class of plains cottonwood will remain.

Under continued frequent and severe defoliation, in combination with trampling, areas of bare ground will begin to develop. Introduced grasses, resistant to grazing, such as Kentucky bluegrass and smooth brome grass, typically invade and can eventually dominate the site. Noxious weeds, such as leafy spurge, Canada thistle, and hounds tongue, can also invade. The few mature cottonwoods that remain will become decadent and eventually die. Introduced woody species, such as Russian olive and tamarix can invade the site. At this point, there is little that can be done to the site to return it to a native plant community.

Plains cottonwood can persist on terraces adjacent to streams, as long as occasional flooding occurs and the level of browsing is controlled. The exception to this is where down-cutting of the stream has lowered the water table.

The historic climax plant community (description follows the State and Transition Model Diagram) has been determined by study of rangeland relic areas, or areas protected from excessive disturbance. Trends in plant communities going from heavily grazed areas to lightly grazed areas, seasonal use pastures, and historical accounts have also been used.

The following is a State and Transition Model Diagram that illustrates the common plant communities that can occur on the site and the transitions between these communities. The ecological processes will be discussed in more detail in the plant community narratives following the diagram.



FSD - Frequent and Severe Defoliation.

PG - Prescribed Grazing (proper stocking rates with adequate recovery periods during the growing season).

VLTPG - Very Long-term Prescribed Grazing (could take generations)

Plant Community Composition and Group Annual Production

Diverse Age Class Plains - Cottonwood, Mid-Tall Grasses, Shrubs Plant Community (HCPG)

COMMON NAME/GROUP NAME	SCIENTIFIC NAME	SYMBOL	Annual Production (Normal Year)		
			Total: 2500		
			Group	lbs./acre	% Comp.
GRASSES AND GRASS-LIKES					
WARM-SEASON MID/TALL GRASSES			1	375 - 1125	15 - 45
prairie sandreed	Calamovilfa longifolia	CALO	1	125 - 875	5 - 35
little bluestem	Schizachyrium scoparium	SCSCS	1	250 - 750	10 - 30
sand bluestem	Andropogon hallii	ANHA	1	125 - 750	5 - 30
switchgrass	Panicum virgatum	PAVI2	1	0 - 250	0 - 10
COOL-SEASON MID-GRASSES			2	375 - 1000	15 - 40
needleandthread	Hesperostipa comata	HECO26	2	375 - 1000	15 - 40
RHIZOMATOUS WHEATGRASSES			3	125 - 250	5 - 10
western wheatgrass	Pascopyrum smithii	PASM	3	125 - 250	5 - 10
thickspike wheatgrass	Elymus lanceolatus	ELLAL	3	125 - 250	5 - 10
WARM-SEASON SHORT GRASSES			4	125 - 250	5 - 10
blue grama	Bouteloua gracilis	BOGR2	4	125 - 250	5 - 10
SEDGES			5	0 - 250	0 - 10
threadleaf sedge	Carex filifolia	CAFI	5	0 - 250	0 - 10
other sedges	Carex spp.	CAREX	5	0 - 125	0 - 5
MISCELLANEOUS GRASSES			6	250 - 375	10 - 15
Indian ricegrass	Achnatherum hymenoides	ACHY	6	0 - 125	0 - 5
prairie junegrass	Koeleria macrantha	KOMA	6	0 - 125	0 - 5
sand dropseed	Sporobolus cryptandrus	SPCR	6	0 - 125	0 - 5
Sandberg bluegrass	Poa secunda	POSE	6	0 - 125	0 - 5
perennial grasses/grass-likes (native)		2GRAM	6	0 - 125	0 - 5
FORBS			7	125 - 250	5 - 10
American vetch	Vicia americana	VIAM	7	0 - 50	0 - 2
cudweed sagewort	Artemisia ludoviciana	ARLU	7	0 - 50	0 - 2
dotted gayfeather	Liatris punctata	LIPU	7	0 - 50	0 - 2
eveningprimroses	Oenothera spp.	OENOT	7	0 - 50	0 - 2
false boneset	Brickellia eupatorioides	BREUC	7	0 - 50	0 - 2
fringed sagewort	Artemisia frigida	ARFR4	7	0 - 50	0 - 2
groundsels	Senecio ssp.	SENEC	7	0 - 50	0 - 2
hairy goldaster	Heterotheca villosa	HEVI4	7	0 - 50	0 - 2
heath aster	Symphotrichum ericoides	SYERE	7	0 - 50	0 - 2
ironweed	Vernonia spp.	VERNO	7	0 - 50	0 - 2
larkspurs	Delphinium spp.	DELPH	7	0 - 50	0 - 2
milkvetches	Astragalus spp.	ASTRA	7	0 - 50	0 - 2
penstemons	Penstemon spp.	PENST	7	0 - 50	0 - 2
prairie clovers	Dalea spp.	DALEA	7	0 - 50	0 - 2
prairie coneflower	Ratibida columnifera	RACO3	7	0 - 50	0 - 2
pussytoes	Antennaria spp.	ANTEN	7	0 - 50	0 - 2
scarlet globemallow	Sphaeralcea coccinea	SPCO	7	0 - 50	0 - 2
scurfpeas	Psoraleidium spp.	PSORA2	7	0 - 50	0 - 2
western ragweed	Ambrosia psilostachya	AMPS	7	0 - 50	0 - 2
other perennial forbs (native)		2FP	7	0 - 125	0 - 5
SHRUBS			8	125 - 375	5 - 15
silver sagebrush	Artemisia cana	ARCA13	8	125 - 250	5 - 10
roses	Rosa spp.	ROSA5	8	0 - 125	0 - 5
sand sagebrush	Artemisia filifolia	ARFI2	8	0 - 125	0 - 5
western sandcherry	Prunus pumila	PRPUB	8	0 - 125	0 - 5
western snowberry	Symphoricarpos occidentalis	SYOC	8	0 - 125	0 - 5
leadplant	Amorpha canescens	AMCA6	8	0 - 50	0 - 2
plains pricklypear	Opuntia polyacantha	OPPO	8	0 - 50	0 - 2
other shrubs and half-shrubs (native)		2SHRUB	8	0 - 125	0 - 5
TREES					
plains cottonwood	Populus deltoides ssp. monilifera	PODEM	9	125 - 375	5 - 15
boxelder	Acer negundo	ACNE2	10	0 - 125	0 - 5
green ash	Fraxinus pennsylvanica	FRPE	11	0 - 125	0 - 5

This list of plants and their relative proportions are based on near normal years. Fluctuations in species composition and relative production may change from year to year dependent upon precipitation or other climatic factors.

Plant Community Narratives

Following are the narratives for each of the described plant communities. These plant communities may not represent every possibility, but they probably are the most prevalent and repeatable plant communities. The plant composition table shown above has been developed from the best available knowledge at the time of this revision. As more data is collected, some of these plant communities may be revised or removed, and new ones may be added. None of these plant communities should necessarily be thought of as "Desired Plant Communities". According to the USDA – NRCS National Range and Pasture Handbook, Desired Plant Communities will be determined by the decision-makers and will meet minimum quality criteria established by the NRCS. The main purpose for including any description of a plant community here is to capture the current knowledge and experience at the time of this revision.

Diverse Age Class – Plains Cottonwood, Mid-grasses, Shrubs Plant Community

This plant community is the interpretive plant community for this site and is considered to be the Historic Climax Plant Community (HCPC). This site evolved with grazing by large herbivores and is well suited for grazing by domestic livestock. Historically, fires likely occurred infrequently. This plant community can be found on areas that are grazed and where the grazed plants receive adequate periods of rest during the growing season in order to recover.

The potential vegetation is about 65-85% grasses, 5-10% forbs, and 5-10% shrubs. The site is highly variable with a diverse mix of mid to tall grasses, forbs, shrubs and trees. Trees can make up 5-15% of the total annual production. This can equate to 10-30% canopy cover. The major grasses include needleandthread, prairie sandreed, little bluestem, and sand bluestem. Various species of shrubs and trees typically occur due to the water table within reach of the woody plants. These can include species such as roses, silver sagebrush, western snowberry, plains cottonwood, boxelder, and green ash. In addition, numerous other species of grasses can occur, along with a wide variety of forbs, because of the position of this site on the landscape and the microclimate produced by the shrubs and trees. Plant diversity is very high.

The total annual production (lb./ac., air-dry weight) of this plant community during an average year is:

	LOW	RV	HIGH
GRASS/GRASSLIKE	1480	1850	2220
FORB	160	200	240
SHRUB	160	200	240
TREE	200	250	300
TOTAL	2000	2500	3000

The following is the growth curve of this plant community expected during an average year:

Growth Curve Number:

Growth Curve Name:

Growth Curve Description:

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	2	13	25	35	10	5	10	0	0	0

(monthly percentages of total annual growth)

This plant community is stable and well adapted to the Northern Great Plains climatic conditions. The diversity in plant species allows for high drought tolerance. This is a sustainable plant community in terms of site and soil stability, watershed function, and biologic integrity.

Transitions or pathways leading to other plant communities are as follows:

- Frequent and severe defoliation, during the growing season, will move this plant community towards the *Single Age Class – Plains Cottonwood, Reduced Mid-grasses Plant Community*. Over a period of years, plant species less tolerant to frequent and severe defoliation will begin to decrease, and those more tolerant will begin to increase. Continuous browsing and trampling will not allow tree seedlings to become established.
- If the water table is lowered significantly, due to down-cutting of a stream for example, seedlings of woody species will not be able to become established. At this point, the potential of the site has changed, and it has become an upland site. The Loamy Ecological Site Description should then be used, from that time on, to make management decisions.

Single Age Class – Plains Cottonwood, Reduced Mid-grasses Plant Community

This plant community typically develops, over a period of several years, under frequent and severe defoliation during the growing season. It is dominated by sod-forming grasses, with only remnants of mid-grasses remaining. The dominant grasses are blue grama and western wheatgrass. Needleandthread, little bluestem, and sand bluestem are nearly absent. Palatable shrubs and trees are heavily browsed, oftentimes having a hedged appearance. No new tree seedlings occur. Only cottonwoods that have reached “escape height” (out of reach of the browsers) remain.

Compared to the Historic Climax Plant Community, blue grama and threadleaf sedge have increased. Western wheatgrass has been somewhat reduced. Needleandthread, little bluestem, and sand bluestem have been greatly reduced. Palatable forbs and shrubs have decreased. Virtually all tree seedlings have been eliminated. Plant diversity is moderate.

The total annual production (air-dry weight) is about 1,750 pounds per acre during an average year, but it can range from about 1,400 pounds per acre in unfavorable years to about 2,100 pounds per acre in above average years.

The following is the growth curve of this plant community expected during an average year:

Growth Curve Number:

Growth Curve Name:

Growth Curve Description:

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	1	9	20	30	20	15	5	0	0	0

(monthly percentages of total annual growth)

This plant community is still stable and can be relatively resistant to change depending on the degree to which the sod has formed. Changes in grazing management can usually affect the plant composition fairly quickly as long as remnants of mid to tall grasses still occur and the water table has not been lowered significantly.

Soil erosion is low due partly to the level topography. Infiltration is somewhat reduced because of the sod-bound condition.

Transitions or pathways leading to other plant communities are as follows:

- Prescribed grazing will move this plant community towards the *Diverse Age Class – Plains Cottonwood, Mid-grasses, Shrubs Plant Community (HCPC)*. Grazing should be deferred to allow recovery of mid and tall grasses, and the degree of browsing of the woody species (especially the cottonwood seedlings) must be monitored closely and controlled.

- Continued frequent and severe defoliation, throughout the growing season, will move this plant community towards the *Decadent Plains Cottonwood, Sod-bound Short-grasses, Bare Ground Plant Community*. Mid to tall grasses are eliminated and the few remaining cottonwoods become decadent and begin to die.

Decadent Plains Cottonwood, Sod-bound Short-grasses, Bare Ground Plant Community

This plant community develops under long-term frequent and severe defoliation. It has become sod-bound. Mid to tall grasses have been eliminated. The dominant grass is blue grama. Other grasses include threadleaf sedge and threeawns. The palatable forbs and shrubs have been nearly eliminated. Remaining trees are decadent and are beginning to die.

Compared to the Historic Climax Plant Community, blue grama, threadleaf sedge, threeawns, and fringed sagewort have increased. Western wheatgrass and needleandthread have been greatly reduced. Little bluestem, sand bluestem, and palatable perennial forbs have been virtually eliminated. Plant diversity is very low.

The total annual production (air-dry weight) is about 1,250 pounds per acre during an average year, but it can range from about 1,400 pounds per acre in unfavorable years to about 900 pounds per acre in above average years.

The following is the growth curve of this plant community expected during an average year:

Growth Curve Number:

Growth Curve Name:

Growth Curve Description:

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	0	5	40	30	20	5	0	0	0

(monthly percentages of total annual growth)

Even with the best range management, this plant community is extremely resistant to change. This is because of the sod-bound condition and the fact that many of the plant species have been removed from the plant community. Oftentimes, a seed source is not readily available.

Transitions or pathways leading to other plant communities are as follows:

- Flooding followed by very long-term prescribed grazing will move this plant community towards the *Diverse Age Class – Plains Cottonwood, Mid-grasses, Shrubs Plant Community*. A timely flood event can result in germination of cottonwood seeds. The cottonwood seedlings can become established, if the grazing and degree of browsing is closely monitored and controlled. It could take generations to reestablish the mid and tall grasses, forbs, and shrubs, depending on the availability of a seed source. Pasture planting may be an option to return this site to a productive condition in a realistic time frame.
- Continued frequent and severe defoliation along with invasion of introduced plants and noxious weeds can move this plant community to the *Russian Olive, Kentucky Bluegrass, Smooth Brome, Noxious Weeds Plant Community*.

Russian Olive, Kentucky bluegrass, Smooth Brome, Noxious Weeds Plant Community

This plant community develops under very long-term frequent and severe defoliation, in conjunction with invasion of introduced plants and/or noxious weeds. Physical impact such as trampling, soil compaction, and trailing typically contribute to this transition. The plant composition is made up introduced grasses, annuals, noxious weeds, and a few species of native forbs and grasses that are very tolerant to frequent and severe defoliation. The site may also be invaded with introduced trees.

The dominant grasses typically include Kentucky bluegrass, smooth brome, threeawn, blue grama, and threadleaf sedge. Annual grasses such as cheatgrass and sixweeks fescue have invaded. The dominant perennial forbs include curlycup gumweed and hairy goldaster. Major shrubs include broom snakeweed, pricklypear cactus, and green sagewort. Noxious weeds, such as leafy spurge, Canada thistle, and hound's tongue may have invaded the site. Introduced trees, such as Russian olive and tamarix may invade and eventually dominate the site.

This plant community is so highly variable, in both species composition and production, that the average annual production cannot be estimated.

The following is the growth curve of this plant community expected during an average year:

Growth Curve Number:

Growth Curve Name:

Growth Curve Description:

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	5	20	35	25	10	5	0	0	0

(monthly percentages of total annual growth)

This plant community is very resistant to change because of the lack of native species and the amount of introduced plants and weeds present. Smooth brome and Kentucky bluegrass can eventually dominate the site due to their rhizomatous growth form and their resistance to heavy grazing. Once this occurs, it is nearly impossible to change the plant composition in a reasonable timeframe.

Soil erosion is low due partly to the level topography. Infiltration is somewhat reduced because of the sod-bound condition.

Transitions or pathways leading to other plant communities are as follows:

- There are few options when this plant community occurs. They include:
 1. Convert the site to pastureland by planting either introduced or native species.
 2. Manage for the plants that are present and that most closely meet your goals and objectives. This would include, at a minimum, prescribed grazing and pest management to control the noxious weeds.

Ecological Site Interpretations

Animal Community – Wildlife Interpretations

Diverse Age Class – Plains Cottonwood, Mid-Grasses, Shrubs community:

The predominance of grasses plus high forb diversity in this community favors large grazers. Trees and shrubs provide suitable thermal and escape cover for mule deer. White-tailed and black-tailed jackrabbit, badger, and coyote commonly use this community. This community also provides habitat for a wide array of smaller mammals, so diverse prey populations are available for raptors such as ferruginous and Swainson’s hawks. Birds such as western kingbird, western meadowlark, lark bunting, and grasshopper sparrow will utilize this community for nesting and foraging. The overstory of large cottonwoods provides habitat for a variety of birds ranging from raptors to neo-tropical migrants.

Single Age Class – Plains Cottonwood, Reduced Mid-Grasses community: This plant community may be useful for the same large grazers that would use the Historic Climax Plant Community. However, the plant community composition is less diverse, and thus, less apt to meet the seasonal needs of these animals. The overstory of large cottonwoods provides habitat for a variety of birds ranging from raptors to neo-tropical migrants.

Decadent Plains Cottonwood, Sod- bound Short-grasses, Bare Ground community: This plant community may still be useful for the same large grazers that would use the Historic Climax Plant Community. However, the plant community composition is less diverse, and thus, less apt to meet the seasonal needs of these animals. The overstory of large cottonwoods still provides some habitat for a variety of birds ranging from raptors to neo-tropical migrants.

Russian Olive, Kentucky bluegrass, Smooth brome, Noxious weeds community: This community has low habitat value for most wildlife species.

Animal Preferences (Quarterly - 1,2,3,4) for commonly occurring plants in MLRA 67 North

Common Name	Scientific Name	Symbol	Cattle	Sheep	Horses	Antelope	Deer	Elk
GRASSES/GRASSLIKES								
alkali bluegrass	<i>Poa juncifolia</i>	POJU	UDUD	NDNU	UDUD	UDUU	UDUU	DPDD
alkali cordgrass	<i>Spartina gracilis</i>	SPGR	UDPU	UPDU	UPDU	UDUU	UDUU	UDPU
alkali muhly	<i>Muhlenbergia asperifolia</i>	MUAS	UDUU	UDUU	UDUU	UDUU	UDUU	UDUU
alkali sacaton	<i>Sporobolus airoides</i>	SPAI	UDPU	UPDU	UPDU	UDUU	UDUU	UDPU
Baltic rush	<i>Juncus balticus</i>	JUBA	NNNN	NNNN	NNNN	NNNN	NNNN	NNNN
basin wildrye	<i>Leymus cinereus</i>	LEC14	DPDD	UPDU	DPDD	UDUU	UDUU	DPDD
big bluestem	<i>Andropogon gerardii</i>	ANGE	UDPD	UDDU	UDPD	UDUU	UDUU	UDPD
blowout grass	<i>Redfieldia flexuosa</i>	REFL	UDUU	UDUU	UDUU	UDUU	UDUU	UDUU
blue grama	<i>Bouteloua gracilis</i>	BOGR2	UDPU	UPDU	UPDU	UDUU	UDUU	UDUU
bluebunch wheatgrass	<i>Pseudoroegneria spicata</i>	PSSP6	DPDD	UPDD	DPDD	UDUU	UDUU	DPDD
bluegrasses	<i>Poa spp.</i>	POA	UPUU	UPND	UPUU	UPND	UPND	UPUU
bluejoint reedgrass	<i>Calamagrostis canadensis</i>	CACA4	UPDU	UDUU	UPDU	UDUU	UDUU	UPDU
buffalograss	<i>Buchloe dactyloides</i>	BUDA	UDPU	UPDU	UPDU	UDUU	UDUU	UDUU
bulrush	<i>Scirpus spp.</i>	SCIRP	NNNN	NNNN	NNNN	NNNN	NNNN	NNNN
Canada wildrye	<i>Elymus canadensis</i>	ELCA4	UDUU	NUNN	UDUU	NUNN	NUNN	UDUU
Fendler's threeawn	<i>Aristida purpurea</i> var. <i>fendleriana</i>	ARPUF	NNNN	NNNN	NNNN	NNNN	NNNN	NNNN
foxtail barley	<i>Hordeum jubatum</i>	HOJU	NDNN	NDNN	NDNN	NDNN	NDNN	NDNN
green needlegrass	<i>Nassella viridula</i>	NAV14	DPPD	UPDU	DPPD	UDUU	UDUU	DPPD
hairy grama	<i>Bouteloua hirsuta</i>	BOH12	UDPU	UPDU	UPDU	UDUU	UDUU	UDUU
Indian ricegrass	<i>Achnatherum hymenoides</i>	ACHY	DPPD	UPDU	DPPD	UDUU	UDUU	DPPD
Indiangrass	<i>Sorghastrum nutans</i>	SONU2	UDPD	UDDU	UDPD	UDUU	UDUU	UDPD
inland saltgrass	<i>Distichlis spicata</i>	DISP	NUUN	NUUN	NUUN	NUUN	NUUN	NUUN
little bluestem	<i>Schizachyrium scoparium</i>	SCSC	UDPU	UPDU	UPDU	UDUU	UDUU	UDPU
muhly	<i>Muhlenbergia spp.</i>	MUHLE	UDUU	UDUU	UDUU	UDUU	UDUU	UDUU
Nebraska sedge	<i>Carex nebrascensis</i>	CANE2	UDUD	UPND	UDUD	UPND	UPND	UDUD
needleandthread	<i>Hesperostipa comata</i> ssp. <i>comata</i>	HECOC8	DPDD	UPDU	DPDD	UDUU	UDUU	DPDD
northern reedgrass	<i>Calamagrostis stricta</i> ssp. <i>inexpansa</i>	CAST13	UPDU	UDUU	UPDU	UDUU	UDUU	UPDU
Nuttall's alkaligrass	<i>Puccinellia nuttalliana</i>	PUNU2	DPUD	NPND	DPUD	UDUU	UDUU	DPPD
panicgrass	<i>Dichanthelium wilcoxianum</i>	DIW15	UDUU	NUNN	UDUU	NUNN	NUNN	UDUU
plains bluegrass	<i>Poa arida</i>	POAR3	NPUN	NPUN	NPUN	NDUN	NDUN	NPUN
plains muhly	<i>Muhlenbergia cuspidata</i>	MUCU3	UDUU	UDUU	UDUU	UDUU	UDUU	UDUU
plains reedgrass	<i>Calamagrostis montanensis</i>	CAMO	UPDU	UDUU	UPDU	UDUU	UDUU	UPDU
prairie cordgrass	<i>Spartina pectinata</i>	SPPE	UDPD	UDDU	UDPD	UDUU	UDUU	UDPD
prairie junegrass	<i>Koeleria macrantha</i>	KOMA	UDUU	NDNU	UDUU	UDUU	UDUU	UDUU
prairie sandreed	<i>Calamovilfa longifolia</i>	CALO	UDPU	UDUU	UDDU	UDUU	UDUU	UDUU
reed canarygrass	<i>Phalaris arundinacea</i>	PHAR3	UDUU	NUNN	UDUU	NUNN	NUNN	UDUU
rushes	<i>Juncus spp.</i>	JUNCU	NNNN	NNNN	NNNN	NNNN	NNNN	NNNN
sand bluestem	<i>Andropogon hallii</i>	ANHA	UDPD	UDDU	UDPD	UDUU	UDUU	UDPD
sand dropseed	<i>Sporobolus cryptandrus</i>	SPCR	NUUN	NUUN	NUUN	NUUN	NUUN	NUUN
sand lovegrass	<i>Eragrostis trichodes</i>	ERTR3	UDPU	UDUU	UDDU	UDUU	UDUU	UDDU
sand paspalum	<i>Paspalum setaceum</i>	PASE5	NUUN	NUUN	NUUN	NUUN	NUUN	NUUN
Sandberg bluegrass	<i>Poa secunda</i>	POSE	NPUN	NPUN	NPUN	NDUN	NDUN	NPUN
sandhill muhly	<i>Muhlenbergia pungens</i>	MUPU2	UDUU	UDUU	UDUU	UDUU	UDUU	UDUU
sedge	<i>Carex spp.</i>	CAREX	UDUD	UPND	UDUD	UPND	UPND	UDUD
sideoats grama	<i>Bouteloua curtipendula</i>	BOCU	UDPU	UPDU	UPDU	UDUU	UDUU	UDUU
slender wheatgrass	<i>Elymus trachycaulus</i> ssp. <i>trachycaulus</i>	ELTR1	DPDD	UPDD	DPDD	UDUU	UDUU	DPDD
spikerush	<i>Eleocharis spp.</i>	ELEOC	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
switchgrass	<i>Panicum virgatum</i>	PAV12	UDPD	UDDU	UDPD	UDUU	UDUU	UDPD
thickspike wheatgrass	<i>Elymus lanceolatus</i> ssp. <i>lanceolatus</i>	ELLAL	DPDD	UPDD	DPDD	UDUU	UDUU	DPDD
threadleaf sedge	<i>Carex filifolia</i>	CAFI	UDUD	UPND	UDUD	UPND	UPND	UDUD
threeawn	<i>Aristida spp.</i>	ARIST	NNNN	NNNN	NNNN	NNNN	NNNN	NNNN
western wheatgrass	<i>Pascopyrum smithii</i>	PASM	DPDD	UPDD	DPDD	UDUU	UDUU	DPDD
FORBS								
American licorice	<i>Glycyrrhiza lepidota</i>	GLLE3	NNNN	NUUN	NNNN	NUUN	NUUN	NUUN
American vetch	<i>Vicia americana</i>	VIAM	UPPU	UPPU	UPPU	UPPU	UPPU	UPPU
arrowgrass	<i>Triglochin spp.</i>	TRIGL	TTTT	TTTT	TTTT	TTTT	TTTT	TTTT
aster	<i>Aster spp.</i>	ASTER	NNNN	NNNN	NNNN	NNNN	NNNN	NNNN
biscuitroot	<i>Lomatium spp.</i>	LOMAT	UDUU	UDDU	UDUU	UDDU	UDDU	UDDU
blue-eyed grass	<i>Sisyrinchium spp.</i>	SISYR	UDUU	UPPU	UDUU	UDUU	UDUU	UDUU
breadroot	<i>Pediomelum spp.</i>	PEDIO2	NUUN	UDUU	NUUN	UDUU	UDUU	UDUU
broadleaf cattail	<i>Typha latifolia</i>	TYLA	UDUU	UUUU	UDUU	UUUU	UDUU	UDUU
buckwheat	<i>Eriogonum spp.</i>	ERIOG	NNNN	UUUU	NNNN	UUUU	UUUU	UUUU
bush morningglory	<i>Ipomoea leptophylla</i>	IPLE	UUUU	UUUU	NNNN	UUUU	UUUU	UUUU
cinquefoil	<i>Potentilla spp.</i>	POTEN	NNNN	UUUU	NNNN	UUUU	UUUU	UUUU
cudweed sagewort	<i>Artemisia ludoviciana</i>	ARLU	UUUU	UDUU	UUUU	UDUU	UDUU	UDUU
curlycup gumweed	<i>Grindelia squarrosa</i>	GRSQ	NNNN	NNNN	NNNN	NNNN	NNNN	NNNN
deathcamas	<i>Zigadenus venenosus</i>	ZIVE	TTTT	TTTT	TTTT	TTTT	TTTT	TTTT
dotted gayfeather	<i>Liatris punctata</i>	LIPU	UPPU	UPPU	UPPU	UPPU	UPPU	UPPU
evening primroses	<i>Oenothera spp.</i>	OENOT	NNNN	NNNN	NNNN	NNNN	NNNN	NNNN
false boneset	<i>Brickellia eupatorioides</i>	BREU	NDUN	NDUN	NNNN	NDUN	NDUN	NDUN
fringed sagewort	<i>Artemisia frigida</i>	ARFR4	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
goldenrod	<i>Solidago spp.</i>	SOLID	NUNN	NUNN	NNNN	NUNN	NUNN	NUNN

Animal Preferences (Quarterly - 1,2,3,4) for commonly occurring plants in MLRA 67 North

green sawwort	Artemisia campestris	ARCA12	NNNN	NUUN	NNNN	NUUN	NUUN	NNNN
greenthread	Thelesperma spp.	THELE	NNNN	NNNN	NNNN	NNNN	NNNN	NNNN
groundsel	Senecio spp.	SENEC	NNNN	NNNN	NNNN	NNNN	NNNN	NNNN
hairy goldaster	Heterotheca villosa	HEV14	NNNN	NNNN	NNNN	NNNN	NNNN	NNNN
heath aster	Symphyotrichum ericoides	SYER	NNNN	NNNN	NNNN	NNNN	NNNN	NNNN
iris	Iris spp.	IRIS	NUUN	NUUN	NNNN	NUUN	NUUN	NUUN
ironweed	Vernonia spp.	VERNO	NNNN	NNNN	NNNN	NNNN	NNNN	NNNN
Lambert crazyweed	Oxytropis lambertii	OXLA3	TTTT	TTTT	TTTT	TTTT	TTTT	TTTT
larkspur	Delphinium spp.	DELPH	TTTT	TTTT	TTTT	TTTT	TTTT	TTTT
lemon scurfpea	Psoralea lanceolata	PSLA3	NNNN	NUUN	NNNN	NUUN	NUUN	NUUN
Maximilian sunflower	Helianthus maximiliani	HEMA2	UDPU	UDPU	UDPU	UDPU	UDPU	UDPU
milkvetch	Astragalus spp.	ASTRA	UDUU	UDUU	UDUU	UDUU	UDUU	UDUU
nailwort	Paronychia spp.	PARON	NNNN	NNNN	NNNN	NNNN	NNNN	NNNN
Pennsylvania smartweed	Polygonum pensylvanicum	POPE2	NNNN	NNNN	NNNN	NNNN	NNNN	NNNN
penstemons	Penstemon spp.	PENST	UPPU	UPPU	UPPU	UPPU	UPPU	UPPU
perennial sunflowers	Helianthus spp.	HELIA3	UPPU	UPPU	UPPU	UPPU	UPPU	UPPU
phlox	Phlox spp.	PHLOX	NNNN	NNNN	NNNN	NNNN	NNNN	NNNN
poison hemlock	Conium maculatum	COMA2	TTTT	TTTT	TTTT	TTTT	TTTT	TTTT
prairie clovers	Dalea spp.	DALEA	UPPU	UPPU	UPPU	UPPU	UPPU	UPPU
prairie coneflower	Ratibida columnifera	RACO3	UPPU	UPPU	UPPU	UPPU	UPPU	UPPU
purple prairie clover	Dalea purpurea	DAPU5	UPPU	UPPU	UPPU	UPPU	UPPU	UPPU
Pursh seepweed	Suaeda calceoliformis	SUCA2	NNNN	NNNN	NNNN	NNNN	NNNN	NNNN
pussytoes	Antennaria spp.	ANTEN	NNNN	NNNN	NNNN	NNNN	NNNN	NNNN
rush skeletonplant	Lygodesmia juncea	LYJU	NNNN	NNNN	NNNN	NNNN	NNNN	NNNN
sandwort	Arenaria spp.	ARENA	NNNN	NNNN	NNNN	NNNN	NNNN	NNNN
scarlet gaura	Gaura coccinea	GACO5	NNNN	NUUN	NNNN	NUUN	NUUN	NNNN
scarlet globemallow	Sphaeralcea coccinea	SPCO	UUDU	UDDU	UUDU	UPPU	UDDD	UDDD
scurfpea	Psoralea spp.	PSORA2	NNNN	NUUN	NNNN	NUUN	NUUN	NUUN
showy peavine	Lathyrus polymorphus	LAP02	UPPU	UPPU	UPPU	UPPU	UPPU	UPPU
silky prairie clover	Dalea villosa	DAVI	UPPU	UPPU	UPPU	UPPU	UPPU	UPPU
slimflower scurfpea	Psoralea tenuiflorum	PSTE5	NNNN	NUUN	NNNN	NUUN	NUUN	NUUN
spiderworts	Tradescantia spp.	TRADE	NNNN	NNNN	NNNN	NNNN	NNNN	NNNN
stiff sunflower	Helianthus pauciflorus	HEPA19	UDPU	UDPU	UDPU	UDPU	UDPU	UDPU
swamp smartweed	Polygonum hydropiperoides	POHY2	NNNN	NNNN	NNNN	NNNN	NNNN	NNNN
tenpetal blazingstar	Mentzelia decapetala	MEDE2	NNNN	NNNN	NNNN	NNNN	NNNN	NNNN
veiny dock	Rumex venosus	RUVE2	NNNN	NUUN	NNNN	NUUN	NUUN	NUUN
water hemlock	Cicuta spp.	CICUT	TTTT	TTTT	TTTT	TTTT	TTTT	TTTT
western ragweed	Ambrosia psilostachya	AMPS	NNNN	NNNN	NNNN	NNNN	NNNN	NNNN
western yarrow	Achillea millefolium	ACMI2	NUUN	NUUN	NNNN	NUUN	NUUN	NUUN
white prairie clover	Dalea candida	DACA7	UPPU	UPPU	UPPU	UPPU	UPPU	UPPU
whiteflower gilia	Ipomopsis longiflora ssp. longiflora	IPLOL	NUUN	NUUN	NNNN	NUUN	NUUN	NUUN
wild onion	Allium textile	ALTE	UDUU	UDUU	UDUU	UDUU	UDUU	UDUU
wild strawberry	Fragaria virginiana	FRVI	NNNN	NUUN	NNNN	NUUN	NUUN	NUUN
woollywhite hymenopappus	Hymenopappus tenuifolius	HYTE2	NNNN	NNNN	NNNN	NNNN	NNNN	NNNN
TREES, SHRUBS, AND HALF-SHRUBS								
antelope bitterbrush	Purshia tridentata	PUTR2	PDDD	PDDD	DDUD	PDDP	PDDP	PDDP
Arkansas rose	Rosa arkansana	ROAR3	UDDU	UDDU	NUUN	UDDU	UDDU	UDDU
big sagebrush	Artemisia tridentata	ARTR2	UNUU	DUUD	UNNU	PPPP	PDDP	DUUU
boxelder	Acer negundo	ACNE2	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
brittle cactus	Opuntia fragilis	OPFR	NNNN	NNNN	NNNN	NNNN	NNNN	NNNN
broom snakeweed	Gutierrezia sarothrae	GUSA2	NNNN	UUUU	NNNN	UUUU	UUUU	UUUU
fourwing saltbush	Atriplex canescens	ATCA2	PDDP	PDDP	PDDP	PDDP	PDDP	PDDP
Gardner's saltbush	Atriplex gardneri	ATGA	PDDP	PDDP	DUUD	PDDP	PDDP	PDDP
greasewood (Toxic in large amounts)	Sarcobatus vermiculatus	SAVE4	DUUD	DUUD	DUUD	DUUD	DUUD	DUUD
green ash	Fraxinus pennsylvanica	FRPE	UUUU	UUUU	UUUU	UDDU	UDDU	UUUU
green rabbitbrush	Chrysothamnus viscidiflorus	CHVI8	DUUD	DUUD	UNNU	PDDP	PDDP	DUUD
leadplant	Amorpha canescens	AMCA6	UPDU	UPDU	UDDU	UPDU	UPDU	UPDU
plains cottonwood	Populus deltoides ssp. monilifera	PODEM	DUDD	DUDD	DUDD	DUDD	DUDD	DUDD
plains pricklypear	Opuntia polyacantha	OPPO	NNNN	NNNN	NNNN	NNNN	NNNN	NNNN
ponderosa pine	Pinus ponderosa var. scopulorum	PIPOS	UTTU	UNNU	UNNU	UNNU	UNNU	UNNU
Rocky Mountain juniper	Juniperus scopulorum	JUSC2	UNNU	UNNU	UNNU	UNNU	DUUD	UNNU
rose	Rosa spp.	ROSA5	UDDU	UDDU	NUUN	UDDU	UDDU	UDDU
rubber rabbitbrush	Ericameria nauseosa	ERNA10	UUUU	DUUD	UUUU	UDDU	DUUD	DUUU
sand sagebrush	Artemisia filifolia	ARFI2	UNNU	UNNU	UNNU	UNNU	UNNU	UNNU
silver buffaloberry	Shepherdia argentea	SHAR	DUUU	DUUU	UUUU	UUUU	PDDP	DUUU
silver sagebrush	Artemisia cana	ARCA13	DUUD	DUUD	UNNU	PPPP	PDDP	DUUD
skunkbush sumac	Rhus trilobata	RHTR	DUUD	DUUD	UUUU	DUUD	DUUD	DUUD
spreading buckwheat	Eriogonum effusum	EREF	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
true mountainmahogany	Cercocarpus montanus	CEMO2	DDDD	PDDD	DDDD	UNNU	PDDP	PDDD
western sandcherry	Prunus pumila var. besseyi	PRPUB	DUUD	DUUD	DUUD	DUUD	PDDP	PUUP
western snowberry	Symphoricarpos occidentalis	SYOC	UUUU	UUUU	UUUU	UUUU	DUUD	DUUU
willows	Salix spp.	SALIX	PDDP	PDDP	DUUD	UUUU	PDDP	PDDP
winterfat	Krascheninnikovia lanata	KRLA2	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP
yucca	Yucca glauca	YUGL	DUUD	DUUD	UUUU	DUUD	DUUD	DUUD

Animal Community – Grazing Interpretations

The following tables list suggested initial stocking rates for cattle under continuous grazing (year long grazing or growing season long grazing) under normal growing conditions; however, *continuous grazing is not typically recommended*. These are conservative estimates that should be used only as guidelines in the initial stages of the conservation planning process. Often, the current plant composition does not entirely match any particular plant community as described in this ecological site description. Because of this, a field visit is recommended, in all cases, to document plant composition and production. More precise carrying capacity estimates should eventually be calculated using the following stocking rate information along with animal preference data, particularly when grazers other than cattle are involved. Under more intensive grazing management, improved harvest efficiencies can result in an increased carrying capacity.

Plant Community 15-17" Precipitation	Production (lbs./acre)	Carrying Capacity (AUM/acre)
Diverse Age Class-Plains Cottonwood, Mid-Grasses, Shrubs (HCPC)	2500	0.7
Single Age Class-Plains Cottonwood, Reduced Mid-Grasses	1750	0.5
Decadent Plains Cottonwood, Sod-bound Short-grasses, Bare Ground	1250	0.3
Russian olive, Kentucky bluegrass, Smooth Brome, Noxious Weeds	(Highly Variable)	

Grazing by domestic livestock is one of the major income-producing industries in the area. Rangelands in this area provide yearlong forage under prescribed grazing for cattle, sheep, horses and other herbivores. During the dormant period, livestock may need supplementation based on reliable forage analysis.

Hydrology Functions

Water is the principal factor limiting forage production on this site. This site is dominated by soils in hydrologic group B and C. Infiltration ranges from moderately rapid to rapid. Runoff potential for this site varies from low to moderate depending on soil hydrologic group and ground cover. In many cases, areas with greater than 75% ground cover have the greatest potential for high infiltration and lower runoff. An example of an exception would be where short-grasses form a strong sod and dominate the site. Areas where ground cover is less than 50% have the greatest potential to have reduced infiltration and higher runoff (refer to Part 630, NRCS National Engineering Handbook for detailed hydrology information).

Rills and gullies should not typically be present. Water flow patterns should be barely distinguishable if at all present. Pedestals are only slightly present in association with bunchgrasses such as bluebunch wheatgrass. Litter typically falls in place, and signs of movement are not common. Chemical and physical crusts are rare to non-existent. Cryptogamic crusts are present, but only cover 1-2% of the soil surface.

Recreational Uses

This site provides hunting, hiking, photography, bird watching and other opportunities. The wide varieties of plants that bloom from spring until fall have an esthetic value that appeals to visitors.

Wood Products

Limited value for campfire and fireplace wood.

Other Products

None noted.

Supporting Information

Associated Sites

(R067AY150WY) – Sandy 12-17 " P.Z.

Similar Sites

(R067AY124WY) – Loamy Lowland 12-17" P.Z. has more western wheatgrass and green needlegrass with less needleandthread and bluestems.

Inventory Data References (narrative)

Information presented here has been derived from NRCS clipping data and other inventory data. Field observations from range trained personnel was also used.

Inventory Data References

<u>Data Source</u>	<u>Number of Records</u>	<u>Sample Period</u>	<u>State</u>	<u>County</u>
SCS-RANGE-417	110	1963 -1987	WY	Platte & others

State Correlation

This site has been correlated with Wyoming, Colorado, and Nebraska.

Type Locality

Field Offices

Wyoming: Cheyenne, Douglas, Lusk, Torrington, Wheatland
Nebraska: Bridgeport, Harrisburg, Kimball, Oshkosh, Scottsbluff, Sidney
Colorado: Greeley, Sterling

Relationship to Other Established Classifications

Other References

Other sources used as references include: High Plains Regional Climate Center, USDA NRCS Water and Climate Center, USDA NRCS National Range and Pasture Handbook, and USDA NRCS Soil Surveys from various counties.

Site Description Approval

State Range Management Specialist

Date

State Range Management Specialist

Date

State Range Management Specialist

Date

Ecological Reference Worksheet

Author(s)/participant(s): _____
Contact for lead author: _____ **Reference site used? Yes/No**
Date: 1/05 **MLRA:** 67A **Ecological Site:** R067AY152WY Sandy Lowland (SyL)
 _____ This *must* be verified based on soils and climate (see Ecological Site Description). Current plant community *cannot* be used to identify the ecological site.

Indicators. For each indicator, describe the potential for the site. Where possible, (1) use numbers, (2) include expected range of values for above- and below-average years for **each** community within the reference state, when appropriate & (3) cite data. Continue descriptions on separate sheet.

1. Number and extent of rills: Rills should not be present

2. Presence of water flow patterns: Barely observable

3. Number and height of erosional pedestals or terracettes: Essentially non-existent

4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are *not* bare ground): Bare ground is 15-25% occurring in small areas throughout site

5. Number of gullies and erosion associated with gullies: Active gullies should not be present

6. Extent of wind scoured, blowouts and/or depositional areas: None

7. Amount of litter movement (describe size and distance expected to travel): Little to no plant litter movement. Plant litter remains in place and is not moved by erosional forces.

8. Soil surface (top few mm) resistance to erosion (stability values are averages – most sites will show a range of values for both plant canopy and interspaces, if different): Plant cover and litter is at 75% or greater of soil surface and maintains soil surface integrity. Soil Stability class is anticipated to be 5 or greater.

9. Soil surface structure and SOM content (include type and strength of structure, and A-horizon color and thickness for both plant canopy and interspaces, if different): Use Soil Series description for depth and color of A-horizon

10. Effect of plant community composition (relative proportion of different functional groups) & spatial distribution on infiltration & runoff: Grass canopy and basal cover should reduce raindrop impact and slow overland flow providing increased time for infiltration to occur. Healthy deep rooted native grasses enhance infiltration and reduce runoff. Infiltration is moderately rapid to rapid.

11. Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site): No compaction layer or soil surface crusting should be present.

12. Functional/Structural Groups (list in order of descending dominance by above-ground weight using symbols: >>, >, = to indicate much greater than, greater than, and equal to): Mid stature Cool Season Grasses > Mid and Short Warm season Grasses/Grasslikes > Trees > Forbs = Shrubs

13. Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence): Some decadence and mortality among tree species

14. Average percent litter cover and depth : Average litter cover is 30-40% with depths of 0.25 to 1.0 inches

15. Expected annual production (this is all above-ground production, not just forage production):
12"-17" Precipitation Zone = 2500 lbs/ac

16. Potential invasive (including noxious) species (native and non-native). List species which characterize degraded states and which, after a threshold is crossed, "can, and often do, continue to increase regardless of the management of the site and may eventually dominate the site": Threadleaf Sedge, Kentucky bluegrass, Smooth Brome, Silver sagebrush, Russian olive and Species found on Noxious Weed List

17. Perennial plant reproductive capability: All species are capable of reproducing